An Economic Assessment

of the

Farm Improvement Programme

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ABSTRACT

AN ASSESSMENT OF THE IMPACT OF THE FARM IMPROVEMENT PROGRAMME ON THE DEVELOPMENT OF RURAL AREAS IN IRELAND

The Farm Improvement Programme (FIP) (Reg. 797/85) was introduced in Ireland in 1986 to replace the Farm Modernisation Scheme (FMS) (Dir. 159/92) of 1974-1985. Both schemes had similar objectives. Participants in each followed a grant aided farm development plan drawn up and operated in conjunction with their farm adviser. Nearly three quarters of farmers participated in either the FIP or FMS.

This study was carried out on a sample of 145 FIP participants farms. The average size of the farm business, as measured by standard gross margin, expanded by 15 per cent over the period of the plan. This compared with a planned increase of 9 per cent. Two-thirds of participants expanded the size of their businesses. Some outperformed their gross margin targets to a considerable extent. One-third of farms suffered a decline in gross margins. Stocking rate increased by 9 per cent from 1.38 to 1.5 livestock units per ha and the productivity of labour increased by 37 per cent.

The internal rate of return to all resources involved (including farm investment, grant aid, administration and advisory costs) was high. Eighty to ninety per cent of the on farm development work was carried out by local labour. While sixty two per cent of applicants reported that they would not have made any investments without the aid of the scheme, 26 per cent said that they would have gone ahead in its absence.

The conclusions from the study are as follows: Compared to the rest of Europe Irish agriculture is extensive and under capitalised with a high level of underutilisation of resources. It should therefore be a priority to increase the contribution of agricultural resources to rural and national development by improving their productivity. Because of the high and widespread participation of farmers in both schemes and the positive outcomes on the majority of participant farms, the FIP/FMS programmes seem to provide a suitable model for such development. Under the influence of the EU, however, efficiency inducing objectives are receiving much lower priority in publicly funded agricultural policies in recent years.

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Summary

* Irish farming is one of the most extensive in the EU. Two thirds of Irish farms are characterised by very extensive systems of production and suffer from considerable under-utilisation of resources. The value of production per hectare on the most extensive two thirds of Irish farms is 37 per cent of the European average. In addition Irish farming is one of the least capitalised in Europe. As a consequence average farm income in Ireland is among the lowest in Europe.

* This was the background to the introduction of the Farm Improvement Programme (FIP) in 1986. It implemented the farm development provisions of EC Regulation 797/85. It replaced the Farm Modernisation Scheme (FMS) which operated under EC Directive 159/72 from 1974 to 1985. The purpose of both programmes was to enable farmers to obtain levels of income comparable to those in non farm employment through carrying out a farm development plan. Public funds were used to provide (a) capital grants to facilitate investments - mainly in buildings, fixed assets and land improvements (b) access by the farmer to the agricultural advisory service in developing and implementing the farm development plan. Over 70 per cent of farmers have participated in either the FIP or the FMS. The Farm Improvement Programme focused on grant aiding the fixed capital investment necessary to achieve the objective of increasing farm incomes. It therefore had as its objective the solving of two of the most important problems of Irish farming viz. low incomes and low productivity.

* A survey of a sample of 145 participant farms was used to study the impact of the FIP. The following are some of the results:

* The scheme was a success to the extent that average business size, as measured by aggregate gross margin per farm, increased by 15 per cent. This compared with a planned increase of 9 per cent. The most positive aspect of the impact of the scheme is that two thirds of the participants expanded the size of their businesses. Some of these outperformed their gross margin targets to a considerable extent. Outperformance of targets was associated with higher than planned capital investment. Negative factors are that one third of farms were seen to have suffered a decline in gross margin. Five per cent of these actually planned to decrease gross margin. This leaves 28 per cent who suffered a decline in gross margin without planning to do so. Of the latter 19 per cent had outstanding borrowings. Failure to achieve targets was associated with the operator taking up an off-farm job, sickness or other family developments and lack of or unwillingness of a successor to take up farming.

* Because the problem of underutilisation of resources was prevalent on many farms this issue became an important focus of the analysis. Land and labour are the principal resources under the control of the individual farm operator. The impact of the scheme on the economic utilisation of these resources was measured. Physical intensity in the use of land improved on aggregate by 9 per cent from 1.38 to 1.5 livestock units per ha. Most of this aggregate improvement derived from farms on which gross margin expanded by over 50 per cent.

* The productivity of labour, as measured by the number of livestock units per standard labour unit, increased by 37 per cent over the period of the plan. This was achieved by all percentage groups.

* Rates of return to the resources involved were calculated at over 60 per cent with large farms giving higher returns. Resources included were farm investment, grant aid, administration and advisory costs. The scheme had an impact on local employment in that 80 to 90 per cent of the development work involved local labour.

* If the FIP did not exist just over 62 per cent reported that they would have not have gone ahead with planned investments. Approximately 26 per cent of farmers stated that they would have gone ahead with planned investments in the absence of the programme. The balance of 12 per cent would have gone ahead at a lower level or at slower pace.

* The conclusion to be drawn from these results is that the FIP/FMS type programme provides a suitable model for tackling the problems of low income, low utilisation of resources which exists on many Irish farms. Because of the high and widespread participation of farmers in both schemes and the positive developments on the majority of participant farms this type of development programme has the potential to improve the contribution of agricultural resources to national and rural welfare. Development programmes are, however, receiving a much lower priority in recent years. This results from the dominant influence of the EU in determining Irish agricultural policy objectives.

Introduction

The study on which this paper is based was part of a larger EU funded research project in which laboratories from France, Greece, Spain and the UK took part. The objective of this study was to examine the impact of public policies and institutions on economic development in the more disadvantaged areas of the European Community. Since agriculture is one of the principal natural resource based industries in Irish rural areas and the development of agriculture has been the objective of a long series of public policy initiatives, this study set out to investigate the impact of these policies.

Two EU farm development programmes - the Farm Modernisation Scheme (FMS) and the Farm Improvement Programme (FIP) - had wide application in Ireland and involved both the farm advisory service of Teagasc and the Farm Development Service of the Department of Agriculture and Food. The impact of the FIP, which operated from 1986 to 1994, was chosen as the subject of this study. The study area comprised three counties in the Disadvantaged Areas - Clare, Galway and Mayo. The principal results described in this study were derived from a sample of farms within this area. For reasons of data availability, however, the Cost-Benefit part of the analysis was carried out on long term participants in the National Farm Survey.

The structure of the paper takes the following form. The introduction, deals with the background to the study in the form of some aspects of Irish farm resource development and some comments on previous studies in this area. The second section details the aims and methods used in the study. The third section gives the detailed results of the study. The fourth section draws some conclusions and the fifth discusses a number of implications of the study.

Aspects of Irish Farm Resource Development:
Full-time farms, which are defined in the National Farm Survey as utilising more than 0.75 labour units per farm per annum, comprise the more commercial sector of Irish farming. They are predominantly dairy farms but also include large drystock and crop farms together with large commercial pig poultry and other enterprises. They represent approximately 35 per cent of farms and control 60 per cent of the land area in the country. In addition 50 per cent of the total agricultural labour force operates on full-time farms.

Part-time farms, which are defined as utilising less than 0.75 labour units per farm per annum, represent the more traditional sector of Irish farming. They are predominantly drystock farms. They represent approximately 65 per cent of farms, control 40 per cent of the land area and have 50 per cent of the labour force.

Indices of the value of output per hectare, as an indication of the level of development of Irish farming on both full-time and part-time farms compared to other countries in Europe, are shown in Table 1. The value of

production per ha in Ireland is two-thirds the European average and one-ninth that of the most intensively farmed country i.e. the Netherlands. Full-time farms in Ireland produce 84 per cent of the European average per ha and one-seventh of the average Netherlands output per ha. The remaining two-thirds of Irish farms (part-time farms) produce a value of production per ha which is only 37 per cent of the European average and as low as one-sixteenth of the Netherlands average per ha.

Irish farming is therefore one of the most extensive in Europe. The main reason is the extensive nature of part-time farms.

Table 1: Index of value of output per ha (EU average = 100) 1995

Ireland average	66(1)
Full-time Farmers(3)	89(2)
Part-time Farmers(4)	37(2)
Netherlands	582(1)
EU 15 Average	100(1)

Source: (1) Agricultural situation in the Community (CEC) - 1995
(2) National Farm Survey, Teagasc
(3) Full-time farms utilise more than 0.75 standard labour units to operate
(4) Part-time farms utilise less than 0.75 standard labour units

Table 2 shows the index of change in real average family farm income between the years 1984 and 1993 for all farms, for full-time farms and part-time farms.

Table 2: Index of real average family farm income for Disadvantaged Areas in the (West)[1] compared to the non-Disadvantaged Areas (East) and Ireland as a whole for 1993 (1984 = 100) for full-time part-time and all farms

	All	Full-time	Part-time
Disadvantaged areas (West)1	116	130	87
Non disadvantaged areas (East)	114	114	138
Ireland	113	116	99

Source: Derived from Teagasc National Farm Survey
[1] Taken as the original Disadvantaged Areas comprising the following the Western part of County Cork and counties Kerry, Clare, Galway, Mayo, Roscommon, Leitrim, Sligo, Donegal, Cavan and Monaghan

In the period 1984 to 1993 real average family farm income grew by 13 per cent in Ireland as a whole. The disadvantaged areas of the West showed an increase of 16 per cent compared to 14 per cent for non disadvantaged areas. (Table 2)

In contrast on part-time farms real average family farm income declined by 1 per cent between 1984 - 1993. This decline derived from part-time farms in the disadvantaged areas on which family farm income declined by 13 per cent. Real family farm income on part-time farms in the non-disadvantaged areas increased by 38 per cent.

The above shows that while incomes on full-time farms have continued to increase, incomes on part-time farms, which are already very extensive, have declined. The reason for this arises from the decline in income on part-time farms in the western region.

Table 3: Labour utilisation on full-time and part-time farms

	A: Labour Units available per farm	B: Labour units utilised per farm	Available of labour utilised (B as percentage of A)
Full time farms	1.69	1.65	98%
Part Time farms	0.89	0.31	35%

Source: Derived from Teagasc National Farm Survey

Table 3 shows that utilisation of available labour on part-time farms is much lower than utilisation of available labour on full-time farms. Only 35 per cent of available labour is utilised on part-time farms. Since approximately half of the available labour and nearly 40 per cent of the land area are on part-time farms (i.e. farms that utilise less than 0.75 labour units) this is a serious issue from the standpoint of the development of rural resources.

In addition to being extensive in their use of land, part-time farmers in the disadvantaged areas under-utilise their labour resource to a considerable extent and continue to suffer a decline in real income. The under-utilisation of resources on part-time farms should be the focus of attention of any programme to improve the economic impact of farming on the viability of the disadvantaged areas in Ireland.

The level of capitalisation of Irish agriculture can be judged from Table 4 which shows an index of the capital stock per holding for EU countries (Ireland = 100). The main feature of the table is the low level of capital investment in Irish agriculture when compared with other EU countries.

Table 4: Index of value of capital stock* per holding for EU countries (Ireland = 100)

Country	Index
Germany	545
France	383
Italy	185
Netherlands	889
Belgium/Luxembourg	387
UK	806
Denmark	856
Greece	366

Source: Behrens and de Haen, University of Gottingen. European Review of Agricultural Economics 1980 Vol 7-2.

* Total fixed capital not including land

Despite the fact that there has been a high level of capital investment since that study was done, it is unlikely that relative position of Ireland has changed appreciably.

Table 5: Index of capital per ha and per annual work unit 1995

	Capital/ha	Capital/AWU
EU12	100	100
Ireland	47	49
Denmark	165	196
Netherlands	262	122

Source: Farm Accounts Data Network (FADN), CEC

This is corroborated by more up to date FADN statistics shown in Table 5. These show the indices of investment per ha and annual work unit for Ireland, Denmark and Netherlands (EU 12 = 100). Both per hectare and per annual work unit Ireland has an investment of less than half the European average while Netherlands investment per ha and per awu is 2.62 and 1.22 times the EU average respectively. Corresponding figures for Denmark are 1.65 and 1.96 respectively.

The evolution of public policy in relation to agriculture, as exemplified by the balance of public expenditure on development objectives in comparison to income transfer objectives i.e. direct payments is shown in Figure 1. Aggregate public expenditure on development (including grant aid, research, advice, education as well as more recent initiatives such as Leader and Interreg) has declined from £218m to 1980 to £144m in 1996 at 1994 values - a decline of one third. In contrast direct payments have increased in the same period from £52m to £911m - a seventeen fold increase. Income transfer objectives are receiving a much higher priority from public policy makers in comparison with competitiveness maintaining objectives. This arises from the influence of the EU policy agenda. Ireland is a net beneficiary of this policy since a high proportion of direct payments are paid for by EU funds.

Irish agriculture is therefore characterised as being relatively extensive with a high level of underutilisation of labour resources on many farms. Incomes on extensive part-time farms in the disadvantaged areas are tending to decline. Capital investment on Irish farms is also significantly lower than that on farms elsewhere in Europe. Under the influence of EU policy in recent years income transfer policy is receiving a much higher priority in comparison with development policy.

Previous Studies:

Since the objective of this study is to examine the impact of public institutions and policies on disadvantaged and relatively remote regions in the EU, it is of interest to examine the literature on the effectiveness of some of the interventions by public institutions in the past. An important part of the intervention by public institutions in farming at national level in Ireland comprised, on the one hand, grant aid to encourage on farm capital investment and, on the other hand, the funding of research education and

advice in order to encourage innovation. The following paragraphs examine the results of some of the attempts to assess the success of these policy interventions.

The basic assumption underlying these policy initiatives was that the future competitiveness of both individual farms and many rural areas, of which agricultural land and labour were the predominant resources, depended on innovating and updating the basic fixed capital stock and in improving the capacity of the human resources.

The philosophy was that future comparative advantage depended on changes being made in farm systems and practices. Farmers therefore became involved in increasing efficiency and productivity as a result of these changes. Studies have been carried out in Ireland in the past, which attempted to measure the changes in farm businesses over a number of years under the influence of specific development programmes.

The earliest and most comprehensive such work was by Scully (1971), undertaken between 1965 and 1970. It reported on development in 12 pilot areas in the west of Ireland. The modus operandi was to change attitudes to development through intensive advisory work and participation in neighbourhood discussion groups. Thus people in these areas were intensively involved in the changes which were taking place. The results of this work indicated that total gross margin in the pilot areas increased by eight per cent per annum during the five year period - compared with less than one per cent per annum in the twelve western counties as a whole. Statistical appraisal showed that intensive advisory work and attendance at neighbourhood group meetings made a significant contribution to this increase in gross margin.

In a paper on technological change on Irish farms, Frawley (1985) found that variables such as information seeking activities and contact with the advisory service were significant predictors of farming performance.

In a paper entitled 'The farmer is not to blame after all' Callaghan and Mannion (1976) questioned the traditional belief that the non-innovative farmer is to blame for his own relative backwardness. The authors contended that the straightforward information dissemination model fails to take into account the need to develop the capabilities of individual farmers to the stage where they can process and use available information. They reached the conclusion that the development of smaller farms, in particular, demands a committed entrepreneurship which has to come from government agencies and the co-operative efforts of farmers. The authors also quoted Neilson (1972 and 1973) as saying that information which explains how rewards can be obtained is much more effective in motivating non-innovators than information which simply states that rewards are available.

In his assessment of the Small Farm (Incentive Bonus) Scheme (which operated from 1968 to 1974), Leavy (1976) compared participants in the scheme with a similarly motivated control group who had applied for the

scheme but who were ineligible since they were judged as being over the farm size limit. Participants increased gross margins over a 4-year period at twice the rate of non participants (18 per cent pa v 9 per cent pa). A follow-up study five years later highlighted that advisory contact was high during the period of participation in the scheme. In the following five years advisory contact declined (Dervan 1978). In this period also, 40 per cent of the original participants experienced a reduction in gross margins.

In Ireland 'the Farm Modernisation Scheme' was the name given to an EU wide farm development programme set up under Directive 159. Leavy (1991), in his analysis of participants in this scheme, recorded that the average size of the business of the participants, as measured by gross margin, expanded by one-third. Those participants with advisory contact expanded by 56 per cent, participants with no advisory contact expanded by 19 per cent while non-participants contracted by 17 per cent. Statistical analysis showed that farm and business size, the farm operator being married, advisory contact and education were positive influences on gross margin, while increasing age was a negative factor. Using conservative assumptions, the return to the Irish economy for all the investment involved, including grant aid and advisory and educational costs, varied between 11 and 18 per cent.

Conway (1984-85) addressed the problem of how to increase active participation by the disadvantaged in the development process. The lack of access to off-farm occupations confines improved earning capacity to increases in farming income. Because of the poor prospects of attaining social norms for living on limited resources many people on small farms have abandoned efforts at increasing income, do not utilise their resource fully and consequently have accepted a lower standard of living. Successful farmers on the other hand have concentrated on intensive enterprises and are in contact with advisory services. Conway advocates giving priority to the disadvantaged if we are to widen productive participation in development. Productive potential should be exploited where exploitation is economically feasible.

In relation to farmers decisions to instigate change in the farm business, the literature emphasises the combined influences of the farm unit, the farm family, the institutional environment and farmers own involvement in development programmes.

Public policy intervention in Irish agriculture development goes back to the last century. The objective of maintaining as many families as possible in economic security on the land is enshrined in the Constitution. The evolution of agricultural development policy since the 1950s is shown in Appendix 1. Development policy has moved from the pursuit of very broad objectives towards much narrower and, specifically, competitiveness and efficiency objectives. In addition, environmental and diversification objectives are becoming more important relative to economic objectives in recent years. These developments arise from the influence of EU policy since Ireland joined in 1973. EU policy has also ensured that expenditure on income transfer in the form of direct payments, is becoming the dominant aspect of public policy intervention.

Aims and Methods

Agriculture is one of the principal natural resource based industries in the disadvantaged areas. It has been the focus of a long series of public policy initiatives. It was therefore decided that the institutions formed to administer these policies should come within the scope of this study. Since the objective of the study was the examination of public institutional impact on remote and lagging regions, a programme with development objectives was deemed appropriate for assessment and the Farm Improvement Programme (FIP) was selected for this purpose.

Farm Development Schemes

A total of approximately 106,000 farmers participated in the Farm Modernisation Scheme (FMS) between 1974 and 1985. Approximately 36,000 farmers participated in the FIP between 1986 and 1994. Allowing for the fact that approximately 50 per cent of the FIP participants were already participants in the Farm Modernisation Scheme, approximately 125,000 farmers participated in one or other or both schemes. This is a high proportion (approx. 75 per cent) of the country's farmers. It varied from 50 per cent to 60 per cent in counties of the north east and north west to 80 per cent to 100 per cent in counties of the south and east, together with Longford and Monaghan (Figure 2). Total grant-aided investment for all farms is calculated at £1,236m. Grant aid to the value of £411m was paid on this investment. Per farm, the figures were £10,000 approximately grant aided investment and £3,300 approximately paid in grant aid. A total of 42 per cent of all grant aid to farms during the period 1975 to 1994 was paid under the FMS or the FIP.

When allowance is made for overlap, therefore, these two development programmes, the FMS between 1974 and 1985 and the FIP between 1986 and 1994, have influenced development on 120,000 to 130,000 farms. These were the focus of on farm development by the Farm Development Service (FDS) of the Department of Agriculture, Food and Forestry and the farm advisory service. This type of development was deemed therefore to be a good example of the influence of these institutions on the development of rural areas. The most recent development scheme which operated in the study area[1] and indeed in the whole country, was the FIP. The widespread application of this and similar schemes was the reason it was selected for assessment.

The Farm Improvement Programme (FIP):

The Farm Improvement Programme was introduced on 4th February 1986 to implement the investment aid provisions of EC Council Regulation 797/85 on improving the efficiency of agricultural structures. The Programme replaced the Farm Modernisation Scheme which was terminated in 30 September 1985. For the principal features and details on participation in the FIP see Appendices 2 and 3. Total participation over the whole period 1986 to 1994 was 36,157 (Appendix Table 2). Total grant aid amounted to £130.2m.

[1] The Counties of Clare, Galway and Mayo

Investment tended to be higher in disadvantaged areas (Figure 3 in Appendix 3).

The programme was administered jointly by the Farm Development Service (FDS) of the Department of Agriculture, Food & Forestry and the farm advisory service (Teagasc). Applicants applied to Teagasc. The adviser then provided assistance in the preparation of the 'improvement plan'. Once finalised this was submitted to the FDS which administered the grant aid on fixed investments.

It was judged therefore that these farmers would have fairly good contact over a long period with both the Department of Agriculture, Food & Forestry and the farm advisory service. Since it was a condition of the scheme that they pursue a development plan over a period of years, they were likely to have invested substantial capital in the development of their farms. In addition access to information was available on these farms on a confidential basis. With the qualification discussed in the succeeding paragraph it was therefore decided to analyse the impact of the FIP by surveying a sample of farmers in the study area which participated in the FIP.

Before deciding on this course of action a number of problems had to be solved. Ideally a rigorous cost benefit analysis would be the most suitable procedure in analysing the economic impact of the FIP on farming. To do this, however, it would be necessary to have access to detailed records on representative farms over an extended period. Such detailed records could not be collected in a once off farm survey. In this situation the ideal would be to use a sample of farms who were participants in the National Farm Survey (NFS). A sample existed for all years from 1984 to 1992. It was, however, not possible to carry out an up to date survey on these farms for reasons of cost and time. It was decided therefore that any cost benefit type analysis would be carried out separately using the matched sample of farms which participated in the NFS between the years 1984 and 1992. This would fulfil the need to evaluate and examine the general development of the farms and the cost in resources (including institutional resources to the extent that they could be calculated) which was involved. However, since no up to date survey was possible on these farms, a separate survey was carried out on the sample of farms in the study area which participated in the FIP as is mentioned in the previous paragraph. This latter survey forms the basis of the main part of the farm business analysis which follows.

Sampling Participants in the FIP

In total there were approximately 170,600 farmers in Ireland in 1991, 60 per cent located in the more disadvantaged areas (DA), i.e., the 11 Western Counties (Table 6). Within the study area there were over 39,000 farmers, 23 per cent of all farmers and 39 per cent of DA farmers. Between 1985 and 1995 approximately one-fifth of all farmers participated in the FIP, over half (52%) of these were in the 11 Western Counties. Twenty three per cent of the total were located within the study area. Comparing participation rates in Ireland, the west and the study region shows that 19.8 per cent of farmers in Ireland participated in the FIP, 17.4 per cent in the west and 19.8 per cent in

the study area of Clare, Galway and Mayo. Farmers participating in the FIP in the study area comprised the population from which a sample was drawn. As noted above, baseline data were available from administrative records extracted from files located in Teagasc local offices. To supplement this information a sample of FIP participants was selected and interviewed. Given the numbers involved, a decision was taken to focus on those farmers who joined the FIP in 1991. The year 1991 was chosen as an appropriate year for a number of reasons: it allowed sufficient time for the investments to be made and to begin to have an impact on the farm business; it limited problems of recall which an earlier time period may have introduced and records for this period were readily available.

Field Survey

In total in 1991, 1,654 farmers applied for FIP assistance, of whom 656 (40%) were located in the West and 248 (38%) of these came from within the study area (Table 6). From the 248 farmers a sample of 162 (65%) was selected for interview. This selection was based on the numbers of farms registered on file in the main administrative offices in the study area. In the survey ten participants were not contactable, two were no longer farming and five refused to participate in the survey, resulting in 145 completed questionnaires - 36 from Mayo, 54 from Galway and 55 from Clare.

Table 6: Total number of farms and total number participating in the FIP in 1986-95 and in 1991 in Ireland, the West and the study area.

	Ireland	11 Western Counties	Study Area
Total number of farms 1991	170,578	100,869	39,328
Total number of farms participating in the FIP 1986 - 1995	33,800	17,589	7,786
Total number of farms participating in the FIP 1991	1,654	656	248

The field survey was carried out in December-January 1996 by Teagasc staff. Much of the questionnaire dealt with farmer attitudes to development programmes and policies. This data will form part of a separate report. Specific economic questions in the questionnaire concentrated on establishing numbers of livestock, area of crops, whether development would have taken place in the absence of the programme and what labour was involved. This information was used to:

1. calculate the level of gross margin achieved in 1995
2. examine the level of deadweight and
3. establish what proportions of the labour used in development derived from the local area.

Cost Benefit Analysis:
Cost benefit analysis, using discounted cash flow methodology, was carried out on farms included in a matched sample of farms which participated in the National Farm Survey in all years from 1984 to 1992. A total of 494 out of 526 farms had a positive net investment over the period 1984 to 1992. Investment in fixed assets was assumed to have a life of 20 years after which it was written off. The discounted cash flow analysis therefore included the years from 1984 to 2004. All capital invested in the farm, including the value of grant aid, was included in the costs. Also included were agency costs i.e. agricultural advice, education and research together with the administrative costs of grant aid represented by the Farm Development Service of the Department of Agriculture (See Appendix 4).

Benefits were defined as increases in cash income. This was calculated by subtracting total costs from gross output taking into account the following adjustments. Since depreciation is a non cash item, it is deducted from total costs. In addition since the object of the exercise is to establish rates of return to the investments, existing interest charges are also deducted from total costs. Gross output was also adjusted to take out the effects of non-cash inventory changes.

In summary the main part of the analysis was carried out on a sample of 145 farmers who participated in the FIP in Galway, Mayo and Clare in 1991. For reasons of data availability cost benefit analysis was carried out on a more general sample of farms which participated in the NFS between 1984 and 1992.

Results

Profile of Sampled FIP Participants

Table 7 shows some characteristics of participants compared with all farms in the country and all farms in the western region. Since age and household size have been shown to be determinants of rate of development the following are some figures on these characteristics: Surveyed farmers at 45.9 years are younger than both the average of all farms (52.3) and the average of farmers in the west (54.4). Sample farms had larger households (5.27) when compared to all farms (3.68) and western farms (3.85). The extent that the operator is involved in off-farm work can be indicative of the importance of the farm business to family income generation. While 24 per cent of all farm operators are involved in off-farm occupations, 27 per cent of western farm operators are so involved. In contrast only 13 per cent of sample farm operators are involved in off-farm occupations.

Since the dairy cow enterprise uses surplus labour more intensively and is the livestock enterprise earning highest gross margin per LU, the proportion of dairy cows in the livestock herd is an important measure of a rational approach to the use of resources. The proportion of total livestock made up of dairy cows on sample farms is 18 per cent which is similar to that of all western farms. It is, however, lower than the average of all Irish farms at 23 per cent.

Total land area, the intensity with which it is used and the economic returns per unit area are important determinants of economic viability. Farm size as measured by utilised agricultural area (UAA) on surveyed farms is larger than the average of all farms 47.3 compared with 27.9 hectares. Sample farms are also twice as large as western farms.

Table 7 also shows the stocking rate in LU/ha for sample farms in comparison to all Irish farms. Sample farms are more intensive in their use of land with a stocking rate of 1.5 LUs per ha compared to 1.38 for all farms and 1.23 for western farms.

Table 7: Some characteristics of survey participants 1995

Characteristic	Sample Farms	All Farms	Western Farms
Age (years)	45.0	52.3	54.4
Household Size (No.)	5.27	3.68	3.85
Operator Involvement off farms %	13	24	27
Per cent of total livestock units represented by dairy cows	18	23	18
Farm Size (UAA)	47.3	27.9	23.0
Economic Size Unit (ESU) per hectare £	490	620	435
Stocking Rate LU/Ha	1.50	1.38	1.23
Per cent of available labour utilised	85	71	52
ESU per annual £ work unit (AWU)	18.4	13.4	9.1

Economic returns per unit area, as measured by economic size unit (ESU)[2] per ha, showed that sample farms at £490 per ha were 11 per cent more intensive than the average of all western farms (£435) but 27 per cent less intensive than all farms in Ireland which earned £620 per ha.

Labour is the other major resource available in rural areas. Underutilisation of labour is a major determinant of lack of viability of many farm businesses. Table 7 shows that sample farms utilised 85 per cent of available labour. The comparable figure was 71 per cent for all farms and 52 per cent for western farms.

The efficiency of the use of labour is also reflected in the figures of ESU per annual work unit (AWU) available on the farm, also shown in Table 7. These were 18.4 ESU per AWU on sample farms 13.4 ESU per AWU on all farms and 9.1 ESUs per AWU on western farms.

In summary sample farms were larger when measured in both land area and ESU. They had similar proportions of each livestock type as average farms in the western region. They had a lower proportion of dairy cows than the average of all farms. Consequently non-dairy stock enterprises represented higher proportions than average on sample farms than they do on all farms in the country.

The farm operator was younger, household size was larger and off farm employment was lower than the average of all farms and western farms. Intensity of land use, as measured by stocking rate, was higher than the average of all farms. ESU per ha was higher than the western average. This reflects the higher stocking rate on sample farms. It was however lower than overall farmer average which reflects the lower proportion of dairy cows on sample farms. Labour use was more efficient on sample farms than on the average of all farms in Ireland or in the western region. Average sample farms were therefore larger and more viable farm businesses than both the average of all farms in Ireland as a whole and of western farms. This may be partly due to the fact that in 1991, the year to which sample farms relate, alternative grant- aided schemes were availed of by smaller farmers.

Farm Performance Under FIP:

To assess the impact of the FIP on sampled farms, data on target plans and on the situation existing on the farms at the time they applied for participation in the scheme was obtained from individual administrative files. Data on the achievements in the year 1995 were collected in the individual farm survey. The focus in the assessment of the impact of the scheme was mainly on the change in the size of the business. The change in gross margin per farm between 1991 and 1995 was the measure used for this purpose. Since we did not have access to farm records, gross margins were calculated by multiplying the number of units of each enterprise by the standard gross margins which were used by farm advisers in the planning

[2] ESU = 1200 ECU of Standard Gross Margin

process. The disadvantage of this procedure was that no assessment of the impact of changes in efficiency was possible. Changes in gross margin therefore reflected mainly the changes in the number of livestock on participant farms.

Table 8 shows for all farms in the sample the means per farm of (a) the actual gross margin for the pre-plan year (b) the target gross margin for the final year of the plan (c) the gross margin actually achieved in the year 1995. It also shows the change in gross margin as indices (assuming the gross margin for the pre-plan year = 100).

Table 8: Mean gross margin per farm pre-plan, target and 1995

	£	Index
Actual pre-plan year	24,335	100
Target final year	26,557	109
Actual 1995	27,889	115

Mean gross margin was £24,335 for all farms in the sample in the year previous to entry into the FIP. The mean target gross margin planned for the same farms was £26,557 an increase of 9 per cent. The gross margin achieved in 1995 was £27,889 an actual increase of 15 per cent.

Table 9 shows the proportion of farms in the sample which reached target gross margin in the year 1995. It also shows the proportion which had yet (in late 1995) to finish plans together with the proportion of farms which did not reach targets.

Table 9: Proportion of farms which reached/did not reach target

	Percentage
Reached target	56
Had yet to finish plan	10
Did not reach target	34

A total of 56 per cent of farms reached or exceeded target gross margin while 10 per cent had yet to finish plans and 34 per cent failed to reach target.

Table 10 shows the proportion of farms by the degree of increase or decrease in gross margin per farm.

Table 10: Percentage of farms in different change categories

Percentage change in gross margin - actual	%
Decrease	33
0 - 25%	35
25% - 50%	18
50% +	14

One third of the sample showed a decline in gross margin while 14 per cent showed an increase in gross margin of over 50 per cent. Intermediate between these were 35 per cent of farms which increased gross margin by between 0 and 25 per cent, and 18 per cent which increased gross margin by between 25 and 50 per cent.

Table 11: Percentage of farms in different gross margin categories compared to target achievement categories

Percentage change in gross margin - actual	Achieved %	Not finished %	Not achieved %	Total %
decrease	3	6	24	33
0 - 25%	23	3	8	35
25 - 50%	16	0	2	18
50% +	14	1	0	14
Total	56	10	34	100

Table 11 shows the proportion of farms achieving or not achieving planned targets by increase or decrease in gross margin. The most significant fact in this table is that most farms which achieved their targets also expanded gross margin. Only 3 per cent of farms showed a decrease in gross margin and at the same time achieved targets. Of the 10 per cent of farms which have yet to finish plans, 6 per cent have suffered a decline in gross margin. A question arises as to whether these farms would eventually reach gross margin targets. Of those which had not reached planned targets 10 per cent had expanded gross margin but on 24 per cent of farms gross margins had actually declined.

In Table 12 the proportion of farms in each actual gross margin change category is compared with the proportion planned in each category. The rows show the percentage of farms in each actual gross margin change category in 1995 while the columns show the percentage of farms by planned percentage change. Comparing planned with actual achievements the following are the results. Thirteen per cent of the sample planned to decrease gross margin while 33 per cent actually did so. Nearly two thirds or 64 per cent planned to increase gross margin by 0 - 25 per cent while 35 per cent or just over one third actually did so. Fourteen per cent planned to increase gross margin by 25 to 50 per cent while eighteen per cent actually did so. Nine per cent of farms planned to increase gross margin by over 50 per cent and 14 per cent actually achieved this target.

Table 12: Percentage of farms in different gross margin change categories Actual compared to Planned

Percentage change in gross margin - actual	Per cent change in gross margin planned				
	decrease	0 - 25%	25 - 50%	50% +	Total
decrease	5	21	4	3	33
0 - 25%	4	27	2	1	35
25 - 50%	2	10	4	1	18
50% +	2	6	3	3	14
Total	13	64	14	9	100

Table 13: Percentage of farms in different gross margin change and debt level categories

Percentage change in gross margin - actual	Level of Debt £					
	No debt	0 - 10,000	10,000 - 20,000	20,000 - 50,000	50,000 +	Total
decrease	14	9	2	8	0	33
0 - 25%	8	11	7	8	1	35
25 - 50%	2	6	3	4	2	18
50% +	3	5	3	3	0	14
Total	27	31	16	23	3	100

Table 13 shows the proportion of farms with different levels of borrowing by increase or decrease in gross margin. Twenty seven per cent of farms had no debts when surveyed. Thirty one per cent had debts less than £10,000. Sixteen per cent had debts of £10,000 to £20,000. Twenty three per cent had debts of £20,000 to £50,000 and 3 per cent of farms had debts of over £50,000. Of the 33 per cent of farms in the sample who had a decrease in gross margin, fourteen per cent of the total had no debt. Similarly eight per cent of all farms who expanded by 0 - 25 per cent, 2 per cent of all farms who expanded by 25 - 50 per cent and three per cent of all farms who expanded by over 50 per cent had no debt. Of the three per cent of farms who had debt exceeding £50,000, 1 per cent increased gross margin by 0 - 25 per cent and 2 per cent by 25 - 50 per cent. Nineteen per cent of the total had incurred debts and also suffered declines in gross margin.

Table 14: Percentage of farms in different gross margin change categories Index of gross margin planned compared to achieved

Change percentage increase in gross margin - actual	Percent of farms	Gross margin planned Index previous year = 100	Gross margin achieved Index previous year = 100
decrease	33	109	79
0 - 25% increase	35	106	112
25 - 50% increase	18	110	136
50% + increase	14	120	199
All	100	109	115

Table 14 shows the index of gross margins (previous year = 100) planned and achieved for farms by gross margin change category. Farms which actually had planned to increase gross margin by 9 per cent suffered a mean decline of 21 per cent in gross margin. Farms which planned to increase gross margin by a mean of 6 per cent actually increased gross margin between 0 - 25 per cent with a mean increase of 12 per cent. Farms which actually planned to increase gross margin by 10 per cent increased gross margin by 25 to 50 per cent with a mean of 36 per cent and farms which actually planned to increase gross margin by 20 per cent actually increased gross margin by 50 per cent plus with a mean of 99 per cent.

That increases in gross margin above target are associated with higher than planned investment and decreases in gross margin are associated with lower than planned investment can be seen in Table 15 which shows planned investment compared with actual investment for each gross margin change category.

Table 15: Percentage of farms in different gross margin change categories Planned investment compared to actual investment

Change in percentage increase in gross margin - Actual	Per cent of farms	Investment planned £	Investment Actual £	Index planned = 100
Decrease	33	26,152	17,321	66
0-25% increase	35	27,047	34,417	127
25-50% increase	18	21,712	36,550	168
50%+ increase	14	24,207	54,045	223
All	100	25,382	31,983	126

On farms on which gross margin declined investments were 34 per cent lower than planned (£17,321 compared to £26,152). On farms on which gross margin increased by between 0 and 25 per cent investments were 27 per cent higher than planned (£34,417 compared to £27,047). On farms on which gross margin increased by 25 to 50 per cent investments were 68 per cent higher than planned (£36,550 compared to £21,712). On farms on which gross margins increased by over 50 per cent investments were 123 per cent more than planned (£54,045 compared to £24,205). Mean overall investment was 26 per cent higher than planned (£31,983 compared to £25,382).

Despite plans to increase business size, gross margin on 28 per cent of farms actually declined (Table 12). Table 16 shows the results of attempts to establish possible explanations for non achievement of targets and for declines in farm gross margins.

Most often mentioned (7%) was the fact that the farm operator had taken up an off-farm job. This reduced labour availability for farming and thereby lowered the emphasis on the development of the farm as a priority. Sickness, death or other family developments was next most often mentioned explanation (6%). De-stocking for unplanned capital expenditure, such as

building a dwelling for member of the family who was getting married, inheritance taxes etc, was an important reason for non achievement of targets on some farms (4%). The only other significant explanation was the lack of a successor or unwillingness of the successor to take up farming (4% of farms). No reason which could explain non-achievement of targets was reported on the remaining 7 per cent of farms.

Table 16: Explanation for non-achievement of target gross margins Per cent of farms

Explanation	Per cent
Off farm job	7
Sickness, death, other family developments	6
Unplanned private investment	4
Old age and lack of successor	4
No reason	7

Table 17: Percentage of farms in different gross margin change categories by change in stocking rate (LU/ha)

Percentage change in gross margin - actual	Percent of farms	Base Year	Planned	Achieved
decrease	33	1.45	1.59	1.33
0 - 25% increase	35	1.51	1.60	1.47
25 - 50% increase	18	1.59	1.80	1.54
50% + increase	14	1.00	1.21	1.70
All	100	1.38	1.54	1.50

Table 17 shows the stocking rate in livestock units per hectare in the pre-plan year, as well as planned and actual stocking rate achieved for participant farms divided according percentage change in actual gross margin. Farms on which gross margins declined over the period 1991 to 1995 were planned to increase stocking rate from 1.45 to 1.59 LUs per hectare. Stocking rate actually declined on these farms to 1.33. Farms on which gross margin increased between 0 - 25 per cent planned to increase stocking rate from 1.51 to 1.60. Stocking rate actually declined on these farms to 1.47. Farms on which gross margins increased between 25 and 50 per cent were planned to increase stocking rate from 1.59 to 1.80 LU per ha. Stocking rate actually declined to 1.54 on these farms. Farms on which gross margin increased by over 50 per cent were planned to increase stocking rate from 1.0 to 1.21 LU per hectare. Stocking rate on these farms actually increased to 1.7 LU per hectare.

Table 18: Percentage of farms in different gross margin change categories by change in gross margin per ha

Percentage change in gross margin - actual	Percent of farms	Gross margin planned Index previous year = 100	Gross margin achieved Index previous year = 100
decrease	33	105	86
0 - 25% increase	35	101	91
25 - 50% increase	18	110	98
50% + increase	14	119	165
All	100	106	100

Table 18 shows the index of the change in gross margin per hectare planned and achieved for participant farms divided according to the percentage change in actual gross margin. Farms which suffered a decline in gross margin were planned to increase gross margin per ha by 5 per cent. Gross margin per ha actually declined by 14 per cent on these farms. Farms which increased gross margin by between 0 - 25 per cent were planned to increase gross margin per ha by 1 per cent. On these farms gross margin per ha actually declined by 9 per cent. Farms which increased gross margin by between 25 to 50 per cent were planned to increase gross margin per ha by 10 per cent. On these farms gross margin per ha declined by 2 per cent. Farms which increased gross margin by over 50 per cent were planned to increase gross margin per ha by 19 per cent. On these farms gross margin per ha actually increased by 65 per cent.

Table 19: Percentage of farms in different gross margin change categories by change in livestock units per standard labour unit

Percentage change in gross margin - actual	Percent of farms	Livestock units per SLU Planned Index previous year = 100	Livestock units per SLU Achieved Index previous year = 100
decrease	33	117	125
0 - 25% increase	35	122	138
25 - 50% increase	18	130	152
50% + increase	14	118	148
All	100	121	137

In Table 19 the index of the change in the number of livestock units per standard labour unit planned and achieved is shown for participant farmers divided according to the percentage change in actual gross margin. Farms which suffered a decline in gross margin were planned to increase the number of livestock units per standard labour unit (SLU) by 17 per cent. The number of livestock units per SLU actually increased by 25 per cent. Farms which increased gross margin by 0 - 25 per cent were planned to increase livestock units per SLU by 22 per cent. On these farms livestock units per SLU actually increased by 38 per cent. Farms which increased gross margin

by 25 to 50 per cent were planned to increase livestock units per SLU by 30 per cent. On these farms livestock units per SLU actually increased by 52 percent. Farms which increased gross margin by over 50 percent were planned to increase livestock units per SLU by 18 percent. On these farms livestock units per SLU actually increased by 48 percent. All farms in the sample planned to increase LU per SLU by 21 per cent. Livestock units per SLU on all farms actually increased by 37 per cent.

Table 20: Percentage of farms in different gross margin change categories by index of change in gross margin per standard labour unit

Percentage change in gross margin - actual	Percent of farms	Gross margin per SLU Planned Index previous year = 100	Gross margin per SLU Achieved Index previous year = 100
decrease	33	116	119
0 - 25% increase	35	118	138
25 - 50% increase	18	127	155
50% + increase	14	118	145
All	100	119	135

Table 20 the index of the change in gross margin per standard labour unit planned and achieved is shown for participant farmers divided into groups according to percentage change in gross margin. Farms which suffered a decline in gross margin were planned to increase gross margin per SLU by 16 per cent. Gross margin per SLU actually increased by 19 per cent on these farms. Farms which increased gross margin by 0 - 25 per cent were planned to increase gross margin per SLU by 18 per cent. On these farms gross margin per SLU actually increased by 38 per cent. Farms which increased gross margin by between 25 - 50 per cent were planned to increase gross margin per SLU by 27 per cent. On these farms gross margin per SLU actually increased by 55 per cent. Farms which increased gross margin by over 50 per cent were planned to increase gross margin per SLU by 18 per cent. On these farms gross margin per SLU actually increased by 45 per cent. All farms in the sample planned to increase gross margin per SLU by 19 per cent. Gross margin per SLU actually increased by 35 per cent.

As discussed already (p. 15) the cost benefit analysis was carried out on a sample of 526 farms which participated in the National Farm Survey in all years between 1984 to 1992.

The following tables show the results of the Cost Benefit analysis in the form of internal rates of return (IRR) and net present value (NPV) at a discount rate of 5 per cent for the aggregate of all farms in the sample with positive investment and for similar farms in the western and eastern regions separately.

Table 21: Internal rate of return and net present value for all farms

Region	No. of Farms	IRR %	NPV £
Ireland	494	66.4	11,403

West	240	70.5	7,365
East	254	72.0	46,665

Source: Derived from Teagasc National Farm Survey files

Table 22: Internal rate of return and net present value for all farms over 20 ha

Region	No. of Farms	IRR %	NPV £
Ireland	382	70.2	20,887
West	166	76.6	17,333
East	216	78.5	61,392

Source: Derived from Teagasc National Farm Survey files

Table 23: Internal rate of return and net present value for all farms less than 20 ha

Region	No. of Farms	IRR %	NPV £
Ireland	112	19.1	1,145
West	74	646.5	1,545
East	38	40.1	15,014

Source: Derived from Teagasc National Farm Survey files

Table 21 shows the IRR and NPV was 66.4 per cent and £11,403 for all farms, 70.5 per cent and £7,365 for western farms and 72.0 per cent and £46,665 for eastern farms. When farms over 20ha are examined separately the mean IRR and NPV for farms over 20 ha in Ireland is 70.2 per cent and £20,887 respectively. IRR and NPV were 76.6 percent and £17,333 for farms in the west and 78.5 percent and £61,392 for farms in the east respectively (Table 22).

The IRR and NPV for farms under 20ha were 19.1 percent and £1,145 respectively. IRR and NPV were 646.5 percent and £1,545 for farms under 20ha in the west and 40.1 percent and £7,747 for farms under 20ha in the east respectively (Table 23).

Impact on the Study Region:

One of the impacts of the FIP which has an effect on local development is the jobs created arising out of development work carried out on farms as a result of the scheme. The following Tables show the responses from the survey on sample farms on this issue.

Table 24 shows that 81.3 percent of responses reported that workers involved in building work came from within the area, 17.2 percent from within the rest of the region and 1.6 percent from within the rest of the country. The figures for workers involved in land reclamation were 95 percent from within the area and 5 percent from within the rest of the region (Table 25).

A similar picture emerges when the origin of the materials is examined - 69.5 percent of respondents reported that building materials originated within the area, 28.9 percent within the rest of the region and 1.5 percent within the rest of the country (Table 26) . The figures for materials for land reclamation were 93.9 per cent reported that materials came from within the area and 4.9 percent from within the rest of the region and 1.2 percent from within the rest of the country (Table 27).

Table 24: Where building workers came from

	% Responses
Within this area	81.3
Within the rest of the region	17.2
Within the rest of the country	1.6

Table 25: Where land reclamation workers came from

	% Responses
Within this area	95
Within the rest of the region	5

Table 26: Where building materials came from

	% Responses
Within this area	69.5
Within the rest of the region	28.9
Within the rest of the country	1.5

Table 27: Where land reclamation materials came from

	% Responses
Within this area	93.9
Within the rest of the region	4.9
Within the rest of the country	1.2

Deadweight

Deadweight is an economic measure which is used to establish the efficiency of development programmes. The basic question asked is 'what would have happened to participants in a programme if that programme had not been undertaken'. The extent to which development would have taken place in the absence of the programme is a measure of deadweight. Since we did not have a control group we tried to establish deadweight by asking the participants what they would have done in the absence of the FIP.

Table 28: What would have happened without FIP programme

	% Responses
Investment would have gone ahead	26
Lower and slower investment	12
No investment	62

Table 28 shows that 26 per cent would have gone ahead with development in the absence of FIP aid. In contrast sixty two percent would not have invested in farm development without FIP aid. Twelve per cent would have made some investment but it would be lower and development, as a consequence,

would be slower. These results indicate that there is therefore a 26 per cent deadweight in the FIP and a 12 per cent partial deadweight. Assuming the accuracy of the measure, all development on 62 per cent of farms and some development on 12 per cent of farms arises out of participation in the FIP and would not have happened otherwise.

In summary the results show that mean average size of farm business on sample participant farms increased by 15 per cent compared with 9 per cent planned. Higher than planned increases in gross margin are associated with higher than planned capital investment. While two-thirds of participants expanded their businesses one third showed a decline. Mean stocking rate increased by 9 per cent. Most of this increase occurred on those farms with the greatest expansion in business size. Labour productivity increased by 37 per cent and this was spread over all categories. In general rates of return to resources involved in the programme were adequate, deadweight was relatively low and the development work involved in the programme was carried out predominantly by local labour.

Conclusions

Impact of the FIP
To be effective the FIP should confront the basic problems of low income, under-capitalisation and under-utilisation of resources that characterise a high proportion of Irish farms especially in the areas which are designated as 'severely disadvantaged' under the EU disadvantaged areas directive i.e. mainly the 12 Western Countries.

The basic questions therefore are:
(i) to what extent was the objective of the scheme aimed at solving these problems?
(ii) to what extent did it succeed in achieving its objectives on participant farms?
(iii) what proportion of the total population participated in the FIP or in similar schemes in the past?
(iv) were the returns to the public and private resources involved in the programme adequate?
(v) what was the impact in the study region?
(vi) what was the extent of deadweight in the FIP?

Relevance of the objective of the scheme
The Farm Improvement Programme focused on grant aiding fixed capital investment in the context of an overall farm plan with the objective of increasing farm incomes. It therefore sought to solve two of the most important problems of Irish farming viz. low incomes and low productivity of land and labour.

Achievement of the Objectives of the FIP
Because of the lack of access to detailed records for individual farms no calculation of income per farm could be made. The impact of the scheme at individual farm business level was measured by calculating the change in the value of gross margin per farm using the same standard gross margins which were used in planning the farm originally.

The scheme was a success to the extent that average aggregate gross margin per farm increased by 15 per cent. This compared with a planned increase of 9 per cent. When the data were dissaggregated by dividing the farms into categories according to the percentage change in gross margin some positive and some negative impressions emerge. The most positive aspect of the impact of the scheme is that two-thirds of the participants expanded the size of their businesses. Some outperformed their gross margin targets to a considerable extent. This involved higher than planned capital investment. Negative factors are that one-third of farms were seen to have suffered a decline in gross margin. Five per cent of these had actually planned to decrease gross margin. This leaves 28 percent who suffered a decline in gross margin without planning to do so. Of the latter 19 percent had outstanding borrowings. Explanations for non achievement of targets included the

operator taking up an off-farm job, sickness, death or other family developments and lack of or unwillingness of a successor to take up farming.

Because the problem of underutilisation of resources was prevalent on many farms this issue became the focus of some of the analysis in the previous section. Since land and labour are the principal resources under the control of the individual farm operator emphasis was placed on examining the change in value of the gross margin per hectare and per standard labour unit. This was designed to measure the impact of the scheme on the economic utilisation of these resources. Physical intensity in the use of land improved on aggregate by 9 percent from 1.38 to 1.5 livestock units per ha. Most of this aggregate improvement derived from farms on which gross margin expanded by over 50 percent. Stocking rate on all other farms declined. This is mirrored in the change in gross margin per ha which is a measure of the economic aspect of intensity. Gross margin per ha in aggregate remained the same over the period of the plan. There was a significant increase on farms on which gross margin increased by more than 50 per cent. On all other percentage groups mean gross margin per ha declined. Since most of the expansion in livestock took place in the low gross margin enterprises, physical intensity (as measured by livestock units per ha) increased by more than economic intensity (as measured by gross margin per ha). Apart from farms in the group in which gross margin increased by over 50 per cent, mean intensity in the use of the land resource was not increased by participation in the programme.

The productivity of labour as measured by the number of livestock units per standard labour unit increased by 37 percent over the period of the plan. Increases were achieved by all percentage groups. Farms on which gross margin declined increased livestock units per standard labour unit by 25 percent. On farms on which gross margin increased livestock units per standard labour unit increased by 50 percent approximately. The picture is similar when gross margin per standard labour unit is examined. Labour productivity was increased as a result of the capital investment arising out of participation in the Farm Improvement Programme. The total number of labour units utilised declined by 22 per cent on sample farms but the mean labour unit was 37 per cent more productive at the end of the programme than at the beginning.

What proportion of the total population participated in the FIP and in the FMS?

One measure of the overall impact of development programmes involving farm planning, such as the FIP and its predecessor the FMS, could be the proportion of the total population which participated in such schemes. The hypothesis is that the higher the proportion of the farming population which participated the larger the aggregate impact on farm development.

A total of approximately 125,000 farmers participated in the FMS or FIP or both between the years 1974 and 1995. This is approximately 75 per cent of the total number of farmers existing today. A total of 42 per cent of all grant aid during the period was paid under either one or the other scheme.

In terms of the number of farms participating and the proportion of total grant aid paid, farm development programmes, which comprised the FMS and the FIP made a significant impact. As can be seen in Figure 1 (p 6) they had wide application in all areas of the country.

Were the returns to the public and private resources involved in the farm development adequate?
The results of the discounted cash flow analysis carried out on the FADN sample are given above in the section headed Cost Benefit Analysis.

The conclusions from these figures are that the economic rates of return to resources involved in farm development are high in both the west and the east of the country. Returns are lower in aggregate on smaller farms. The returns on smaller farms, however, are still adequate and when separated out into eastern and western regions they show higher than aggregate rates of return.

Impact on Local Area
Seventy to ninety percent of both the workers and the materials involved in the farm development work carried out under the programme had their origins in the local area. Increases in economic activity generated by the operation of the programmes took place predominantly in the local area.

Deadweight
The methodology with which deadweight is measured, i.e. asking recipients what they would have done in the absence of grant aid may tend to bias the reported deadweight downward. On the other hand sample farmers have larger businesses and consequently are more likely to be able to afford to invest in farm development than the average of all farmers. Consequently a full deadweight of 26 per cent and a partial deadweight of 12 per cent probably represents a reasonable assessment of the level of deadweight involved in the FIP.

The Potential of Programmes Modelled on the FIP
Irish farming is characterised by being very extensive with underutilisation of resources being a widespread problem, especially on part-time farms (i.e. farms utilising less than 0.75 labour units per farm). Farming on part-time farms is becoming more extensive in the western region which comprises most of the area designated as 'severely handicapped' by EU Directive 268. Public policy initiatives aimed at developing the farming resources of these areas have been in existence since the 1960s. These included individual farm planning and intensive advice backed up by grant aid for fixed capital investment. Specific initiatives included The Pilot Area Development Programme, The Small Farm (Incentive Bonus) Scheme both of which operated prior to EU entry. Since EU entry in 1973 the FMS and its successor the FIP have been in operation. Evaluation studies on these initiatives have recorded positive results. In the region of 125,000 farmers have participated in the latter two schemes. This is a high proportion of total farmers and seems to indicate that these schemes were deemed relevant to farmer problems.

The impact of the FIP on the viability of participant farms has been measured in this study by the increase in gross margin over the period of the plan. The picture emerging is of approximately two thirds of participants enlarging the size of their business by one third. On the other hand one third of the participants suffered a decline of 21 per cent in gross margin in the same period. Only five per cent of the latter had actually planned to decrease gross margin. This leaves 28 per cent of the sample participants which could be judged to have a problem. Of these 19 per cent actually increased borrowings. Despite the fact that failure to reach targets could be explained in the majority of cases, in terms of contributing to farm viability, the FIP could not be said to have been a totally unqualified success. It could be said, however, to have addressed the twin problems of Irish farming, i.e. low incomes and low productivity and underutilisation of resources. The vast majority of participants increased their economic viability. In addition, the economic return to resources involved in the programme, both public and private, was high.

Mean intensity of the use of land, as measured by stocking rate, increased. Most of this increase, however, took place on the farms on which business size expanded most. Mean intensity in the use of labour increased by one third. This results from the capital investment involved which contributes to a more efficient use of labour. The corollary to the increased efficiency of labour is that the mean labour requirement on sample farms declined by one fifth. Only the farms on which business size expanded most increased labour requirement. Given the general problem of underutilisation of labour this is a significant finding. On the other hand the vast majority of workers and most of the material which were involved in the building and land improvement work originated in the local area. This contributed to local economic development.

Attempts at establishing what would have happened if such a programme did not exist showed that 26 percent of farmers stated that they would have gone ahead without the aid of the FIP. Just over 62 percent of farmers stated that they would not have carried out any investment in the absence of this programme. The balance of 12 percent would have gone ahead at a lower level or at a slower pace. Deadweight therefore is relatively low.

The levels of deadweight recorded in this study indicate that in the absence of a farm development programme such as the FIP much farm investment would not be undertaken. Many more farms would be less viable and the contribution of the farming resources in the disadvantaged areas to rural development would be much less.

Implications of the Study

The main aim of the study was to assess if the Farm Improvement Programme, as implemented in the disadvantaged areas of Ireland, addressed effectively the economic and social problems that confront these areas. The agricultural problems in these areas derive from a very extensive agriculture, most of which suffers from both low productivity and under-utilisation of resources. This results in very low farm incomes. Because farm resources are operating at a level which is well below their economic potential they are not contributing sufficiently to maintaining the economic viability of these remote rural areas. In addition there is some evidence that utilisation of farm resources on the most extensive farms is becoming even more extensive. Therefore the problem is getting worse.

For over thirty years the principal policy initiatives in farm development were based on a combination of programmes. The common feature of these programmes was that they comprised grant aid for farm investment with backing in the form of technical advice and education based on indigenous research. This took the form of explicit planning at individual farm level. The aim was to improve the technical, managerial and financial capacity of participant farms. Planning investment at the individual farm level by professional advisors, while desirable, depends on the availability of skilled professional expertise. The availability of such expertise has however been reduced in recent years. In addition environmental and diversification objectives are becoming more important relative to economic objectives and income transfer policies are receiving a higher priority relative to development policies.

Attempts to assess the efficacy and efficiency of development programmes have shown that, in the main, results were positive. The assessment of the FIP in this study showed that, despite some problems in a minority of farms, business size grew significantly. The returns to the resources involved in the programmes, including on farm investment and agency costs, were high. While intensity of land use improved on only a minority of farms, labour productivity was improved on the vast majority of farms. A very high proportion of farmers participated in the programmes. Since 1974 when the EU programmes were first introduced, the majority of farmers participated in either the FIP or the FMS. While significant participation occurred in all areas of the country very high levels occurred in some areas, including some small farm counties in the disadvantaged areas. This study shows that these programmes contributed to increased efficiency and improved the viability of participant farms. The vast majority of both the workforce and the materials used had their origin in the local area and therefore had a beneficial economic impact on the local area.

Given the extensive nature and low productivity of farming in the disadvantaged areas, on farm development policies should be very relevant. They should help to ensure that many more farms will attain or retain viability. The evolution of the EU policy agenda, however, is moving away

from development and competitiveness inducing policy objectives towards environmental, diversification and, especially, income transfer objectives. Since the EU is an important, and indeed dominant, source of funds in many programmes national policy is moving in the same direction with the result that the majority of the farm development programmes, which were available heretofore, have been suspended. In addition, direct payments have become an important component of the income of many farms. It is, however, important that we continue to pursue efficiency and competitiveness objectives for the agricultural industry. This should not only increase the incomes of individual farmers but also ensure that agricultural resources contribute optimally to maintaining the economic and social viability of many rural areas. The hypothesis is that the greater the number of viable farms the bigger the impact of the farm sector in maintaining population and economic well-being in rural areas.

Appendix 1
Public Policy

Public Policy in Agricultural Development

Public policy intervention has, been a major element in restructuring the economic base of the Irish agricultural sector. From the end of the last century the government became more directly involved in the pursuit of agricultural efficiency. Since then three major sets of measures have been in operation: price and market supports, structural improvement measures, and direct subsidisation or income transfers (Commins and Cawley 1994: 11). Traditionally, the overall aims and objectives of agricultural policy in Ireland have sought support of the family farm. This objective has been enshrined in the constitution which expresses the desire to maintain on the land in economic security as many families as possible.

'The clearest statement of agricultural policy was in the third programme (1969 - 1972), specifying the objectives to be: (1) to increase efficiency in production, processing and marketing of farm products; (2) to ensure that agriculture makes the highest possible contribution to the economic and social process of the nation; (3) to ensure that farmers who work their land fully and efficiently share equitably in the growing national prosperity, and that a reasonable relationship is maintained between farm incomes and incomes of other occupations; (4) to improve the structure of agriculture and strengthen the economic and competitive capacity of the viable family farm; (5) to aid the small and economically more vulnerable farmer to secure an acceptable level of income; (6) to improve the conditions of access to external markets for agricultural exports' (Gillmor, 1985: 200).

On joining the EEC, Ireland's national agricultural policy was replaced by the Common Agricultural Policy (CAP). There was a shift away from small farm policy towards efficiency and competitiveness objectives. This policy framework (CAP) guaranteed high levels of price supports and tried to redress socio-structural problems across the Community. The latter included measures designed to encourage structural change, the early retirement of older farmers, the development of agricultural education and to recognise the spatial component of the uneven development of the sector. The CAP greatly benefited Irish farming up to about 1979 (Walsh and Gillmor, 1993). Nationally, during this time, emphasis was placed on the need to increase the efficiency of production. State aid was provided in the form of unemployment assistance for small holders, financial aid for those retiring early and grant assistance to facilitate capital investments. A higher level of assistance prevailed for farms in the Less Favoured Areas (LFA).

Serious imbalances occurred in the markets for major agricultural products as a result of these policies so that a process of reforming the CAP became inevitable. Various measures have been introduced to deal with these problems. These include quota restrictions, reduced levels of price supports, introduction of limits on the quantity of commodities for which prices are

guaranteed, more selective use of the intervention system, greater emphasis on quality rather than quantity and provision of financial incentives for setting aside land or introducing farm afforestation.

The recent expansion of EU member states and the likely expansion in the future to include east European countries coupled with world pressure to further reduce market supports, focuses attention on the need to increase the competitiveness of farming. Farm business viability within a competitive global market is highly dependent on efficient use of resources and efficient management practises. Efforts to improve efficiency are of paramount importance. Despite this measures to aid structural adjustment have been discontinued.

The Farm Modernisation Scheme (FMS) was introduced in 1974. It was an EU wide farm development scheme which involved detailed planning at individual farm level. It sought to increase the viability and competitiveness of farm businesses by stimulating capital investment. The FMS had as its objective the solution of two problems which were important weaknesses in Irish agriculture (a) low incomes arising from (b) low productivity and under-utilisation of resources. That it was relevant in the Irish context is shown by the fact that a total of 106,000 farmers participated in it.

As outlined above the policy context changed during the 1980s and so the FMS was replaced by the Farm Improvement Programme (FIP). This was a less restrictive scheme than the FMS and allowed for the participation of all full-time farmers. During the period of its operation a number of other schemes were introduced. These aimed at grant aiding specific aspects of farm investment such as land improvement and pollution control. Because of this and the curtailment of access to advisers by smaller farmers brought about by the reduction in the number of advisers and the introduction of charging for services, the FIP had less universal applicability than the FMS. It is nevertheless the last farm development programme involving farm planning. As such it was deemed a suitable scheme for investigation in the context of the present study.

In 1992 further reformation of the CAP involved the introduction of livestock and area payments in conjunction with lower prices, principally for cereals and beef. Payment of premia was restricted to the area of crops and the number of livestock already existing on farms. This put an effective ceiling on increases in output similar to that previously imposed on milk.

Since 1994 all grant aid for on farm investment has been discontinued. A Rural Environment Protection Scheme has been introduced. This moves public policy objectives towards environmental maintenance. The other important objective of public policy at present is diversification of the use of land. Aid for the encouragement of forestry receives most of the resources of this part of the programme and consequently has the largest impact.

Appendix 2
The Farm Improvement Programme

The principal features of the Farm Improvement Programme were as follows:
A person who practised farming as his or her main occupation and who met certain requirements regarding training and experience and whose income per annual work unit (AWU) was below a certain reference income was eligible to undertake a farm improvement plan for at least two or not more than six years. Provided the plan was capable of increasing the farmers' income per AWU by at least 5 per cent over the period of the plan he was entitled to receive grant aid for eligible investment included in the plan. On completion of the plan the income per AWU must have been less than 120 per cent of the projected reference income. Participants must have kept and submitted accounts for each year of the plan. A farmer could undertake a second plan on completion of his or her first plan provided he or she was eligible. Not more than two plans could be undertaken in a six year period. The reference income was fixed at the average gross wage of the non agricultural workforce.

No aid was available for the purchase of land and livestock nor for investment in poultry and egg production or fish farming. Certain restrictions applied on investment aids in the pig and dairy sectors. Otherwise investment aid was subject to an overall investment limit of £45,000 per AWU. Maximum investment per farm was £90,000 except for investment in intensive horticultural projects where the maximum was £180,000. The minimum estimated investment eligible for grant aid was £500. Groups involved in certain joint investments were eligible for aid under the programme provided that 50 per cent of the Group members were eligible. Rates of grant were higher in the Disadvantaged Areas. Young farmers (under 35 years) who had appropriate educational qualifications were eligible for additional aid of 25 per cent of the listed rates if they took out a plan within five years of installation. Aid under the Farm Improvement Programme was available to farmers countrywide from 4th February 1986 to 8th December 1994.

Rates of grant and investments supported are shown in Appendix Table 1.

Appendix Table 1: Investment support under the Farm Improvement Programme

Type of Investment	**Rates of capital grant as a percentage approved costs**	
	Less Favoured Areas	**Other Areas**
Farm Buildings and Fixed Assets		
Housing for bovine animals and sheep	45%	15%
Storage facilities for fodder for bovine animals and sheep	45%	20%
■ Silage including bases	45%	15%
■ Other	55%	20%
Storage facilities for animal wastes and silage effluent	25%	15%
Other buildings	25%	15%
Other fixed assets		
Mobile Equipment		
Slurry tankers (as part of a storage and spreading system)	10%	10%
Basic silage making equipment	10%	-
Land Improvement		
Reclamation (excluding drainage other than drainage work of a minor nature which are a necessary part of land reclamation)	30%	20%
Mountain and hill pasture improvement	30%	-

FIGURE 3: Total FIP Investment by Rural District

[Insert Map]

£

FIP Investment (Rural District)

Appendix 3
Participation in the Farm Improvement Programme

Appendix Table 2: Participation in FIP, grant aid, estimated investment and percentage of investment grant aided

Year	Number of Applicants Participating	Grant aid £m	Estimated Investment £m	% of Investment Grant Aided
86	7,548	1.1	4	27.5
87	8,935	5.9	20	29.5
88	3,195	16.3	54	30.2
89	2,801	9.5	38	25
90	980	19	55	34.5
91	1,774	20	55	36.4
92	3,400	18.8	50	37.6
93	4,075	17.6	55	32
94	3,449	22	65	33.8
Total	**36,157**	**130.2**	**396**	**32.9**

Source: Annual Reports of the Minister for Agriculture & Food

Appendix Table 2 shows the numbers participating in the FIP for the years 1986 to 1994. It also shows total grant aid, estimated investment for each year and the percentage of estimated total investment which was grant aided. Large numbers participated in the farm planning involved in the scheme in the first two years (1986 and 1987). The numbers decreased up to 1990 and increased again to 1993. Total participation over the whole period 1986 to 1994 was 36,157. Total grant aid amounted to £130.2m. Total estimated grant aided investment was £396m. The proportion of total grant aided investment that was represented by grant aid varied from 25 per cent in 1989 to 37.6 per cent in 1992. An average of 32.9 per cent of total grant aided investment was represented by grant aid over the whole period.

Fig. 3: Total FIP Investment by Rural District.

The spread of investment under the FIP throughout the country is shown in Figure 3 which depicts total investment (1986 to 1994) per Rural District (RD). Rates of investment tended to be higher in disadvantaged areas than in non disadvantaged areas. These areas are characterised by being concentrated mainly on cattle and sheep enterprises. The larger farm areas of the east and the dairying areas of the south show a lower level of investment per RD. The hypothesis is that farmers in these areas had already made most of their investment before 1986 when the FIP was introduced. In addition the quota regime was already in existence in the dairying areas. This limited expansion in cow numbers and consequently could be judged to have a depressing effect on farm investment.

Appendix 4
Expenditure and Level of Contact

Appendix Table 3: Expenditure of Department of Agriculture & Food on the administration of the Farm Development Service (1992 Values)

Year	£m
1984	13.1
1985	11.8
1986	11.8
1987	11.8
1988	11.6
1989	11.5
1990	12.4
1991	12.0
1992	13.7
Total	**109.7**

Source: Annual Reports of the Minister for Agriculture & Food and personal discussion with department staff.

Appendix Table 3 shows expenditure by Department of Agriculture & Food on the administration of the Farm Improvement Programme for the years 1984 to 1992. Estimated number of farms contacted per year in that period was approximately 12,000. Total contact for 9 years was, therefore, 109,000. Approximate cost per farm was therefore £1,015

Appendix Table 4: Number of farms in contact with the advisory service, expenditure on research education and advice and average cost per farm (1992 values) for the years 1984 to 1992

Year	Advisory Contact* No of Farms	Research Education and Advice** Total Exchequer Cost (1992 Values) £m	Average cost per farm £
1984	72,045	49.99	694
1985	71,588	45.04	629
1986	66,747	42.78	641
1987	65,905	41.45	629
1988	46,421	38.73	834
1989	31,000	40.25	1299
1990	34,063	31.22	917
1991	32,418	34.06	1050
1992	31,781	34.92	1099

Sources: * ACOT and TEAGASC Annual Reports

** Annual Estimates for Public Services, Department of Finance

Appendix Table 4 shows that the number of farmers in contact with the advisory service declined from 72,045 in 1984 to 31,781 in 1992. Exchequer cost declined from £49,99m in 1984 to £34.92m in 1992. Cost per farm increased from £694 in 1984 to £1,099 in 1992.

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